

# **Final Summary Document for Controlled Burning Operations at LLNL S300**

## **Introduction**

### **▪ Purpose:**

This “summary document” describes the measures LLNL has taken to ensure the effectiveness and safety of its controlled burn operations at the Site 300 Explosive Test Facility, and includes additional measures taken in light of the recent Cerro Grande Fire in New Mexico. This document summarizes reviews and analyses of the LLNL prescribed burn program from LLNL procedures and the National Environmental Policy Act (NEPA) documents such as the *1992 Final Environmental Impact Statement and Environmental Impact Report (EIS/EIR) for the Continued Operations of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore* (DOE EIS-0157).

## **Background**

### **▪ Site Description:**

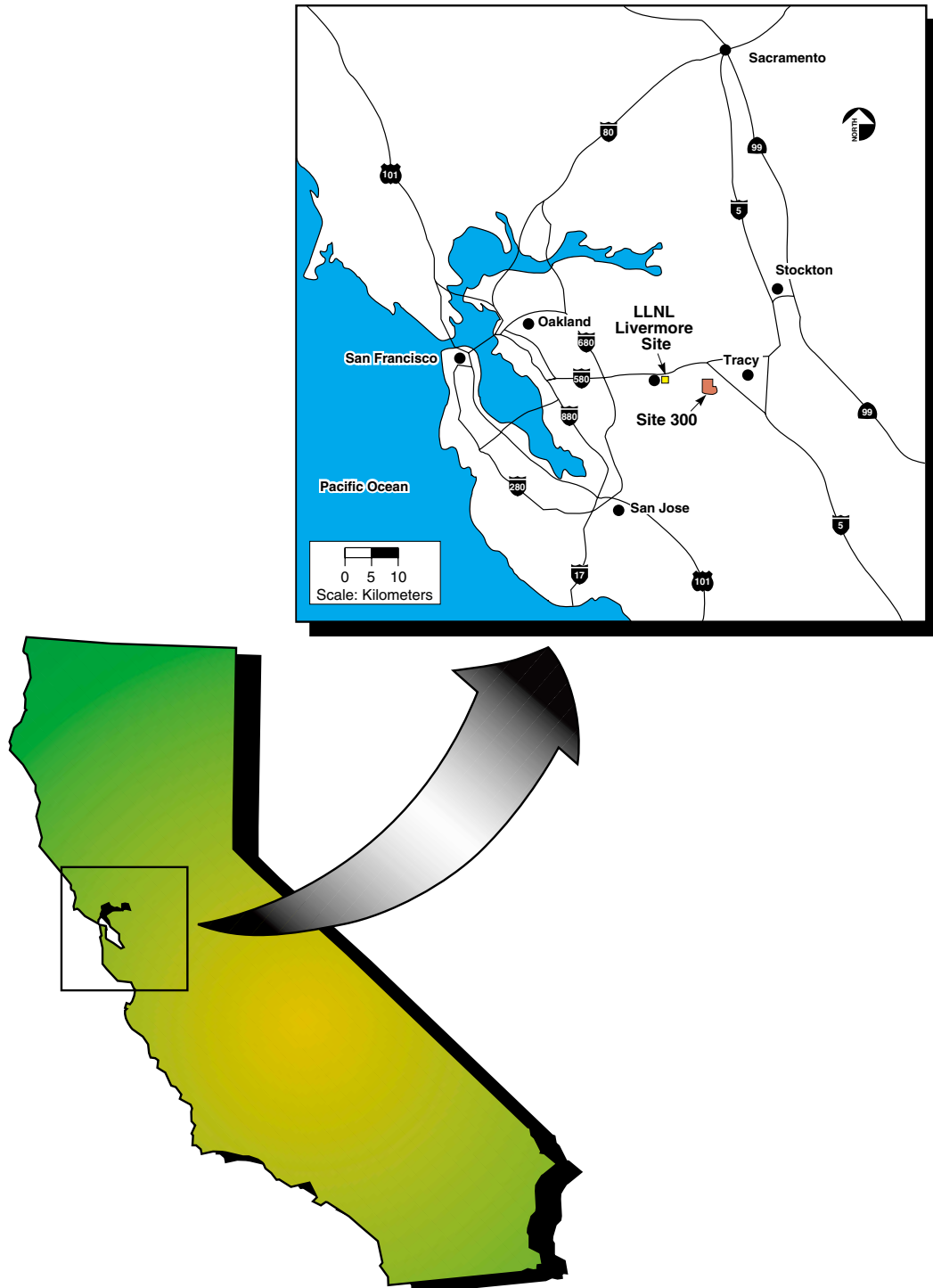
As outlined in the DOE/EIS-0157, Site 300 is located in the California Coast Ranges characterized by low rugged mountains and relatively narrow intervening valleys. It is situated 15 miles east of the Livermore Valley near the eastern edge of the Altamont Hills, close to the western boundary of San Joaquin County (Figure 1). Elevations range from 500' at the southern boundary to 1800' at the higher peaks in the northwestern areas. Site 300 covers approximately 7000 acres (about 11 square miles) of land in eastern Alameda County and western San Joaquin County. Site 300 was acquired in 1953; since then, all grazing and other agricultural activities have been terminated.

Site 300's climate is characterized by mild, rainy winters, and warm, dry summers. Sunshine is abundant throughout the year. It is officially classified as "Mediterranean Scrub Woodland" climate. The mean annual temperature for the 30-year period 1951 through 1980 was 14.5°C (58.1°F), with extremes ranging from -8°C (18°F) to 45°C (113°F). Almost all rainfall occurs between October and April. The average annual rainfall for the 38-year period (1959-1996) at LLNL Site 300 was 264 mm (10.4 in.). The greatest annual rainfall over the same period was 600 mm (23.6 in.); the least was 97mm (3.8 in.).

The principal land use at Site 300 is associated with explosives research and development. Facilities and land used for experimentation are grouped together to form activity areas. These include the General Services Area (administrative and operational support activities); the manufacturing areas (includes chemistry and the processing) and the test and firing areas (East and West).

Figure 1

# U.S. Department of Energy's Lawrence Livermore National Laboratory (LLNL) Livermore Site and Site 300 Facility Locations.



- **History of Controlled Burning Operations at LLNL Site 300:**  
Site 300 has been conducting prescribed burns throughout its 40+ year history for wildfire control. According to the 1992 LLNL EIS/EIR, "LLNL Site 300 began a burning program in the northeastern half of the site in the 1950s and has continued the program annually since 1960. All areas of the site have been burned at least once since 1960. The northern half of the site is burned annually, whereas the southern half has been burned only four times since 1960."

Site 300 annual burning typically takes place in late-May or early-June when the grass (i.e., fuel) is dry enough to sustain a burn and prior to the official declaration of fire season. The moisture content of the fuel is directly related to the amount of fuel consumed and smoke released from the burn. These burns occur only during daylight hours and under permit authority of the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD).

Typically, the controlled burn area covers about 1500 acres, which is divided into plots ranging from six (6) to two hundred and forty (240) acres. (Figure 2.) The fuel load within the control burn plots is low (one to four tons per acre, depending on the grass height and distribution). Existing service roads, fire trails and other barriers separate the grassland-dominated plots. A combination of existing fire roads, temporary control lines, wet-line firing methods and other existing barriers isolate the plot boundaries.

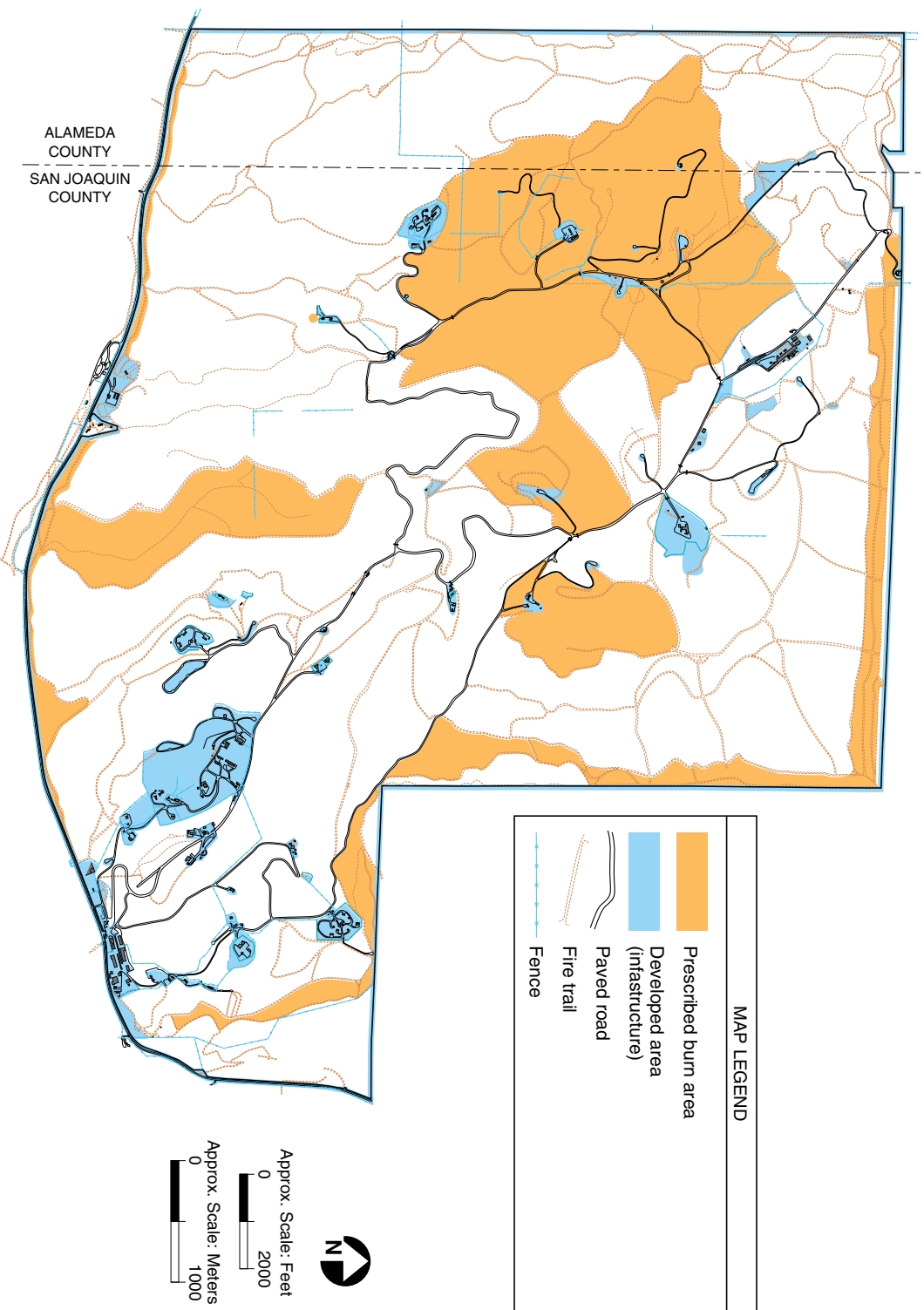
### **Prescribed Burning**

- **Coordination with DOE:**  
LLNL plans and coordinates controlled burning activities each year in consultation with the DOE OAK Operations Office. DOE OAK management and DOE site representatives at LLNL are involved in the review and approval of controlled burns before they are implemented, and in surveillance when the burns are conducted.
- **Notifications of Site 300 Prescribed Burn Interested Parties:**  
LLNL notification of the Site 300 prescribed burn process is primarily to interested parties, specifically persons, organizations, or agencies involved in the planning, approval, implementation, or execution of a prescribed burn or potentially impacted as a result of the prescribed burn (e.g., inside the smoke impact areas). The Site 300 prescribed burn interested parties include local residents, neighbors, local fire officials, local government officials, and state or federal regional offices that have some oversight or direct interest over the controlled burns and/or oversight over resources that could be impacted by the controlled burns.

Site 300's neighbors and nearby residents are notified of the intent to perform the annual burn project in advance of burn activities. This notification is conducted via mail and web from the LLNL Manager for Environmental Community Relations. Individual letters are sent to each of the neighbors in

**Annual Prescribed Burn, Site 300**

**Figure 2**



local proximity to Site 300 two to three weeks prior to the scheduled burn dates. The same letters are distributed to local media (e.g., local newspaper) and also serve as the vehicle for notification of municipalities, governmental organizations and agencies as well as the general population. All information provided to the public includes contact information for the Manager for Environmental Community Relations and for Site 300 Management. These telephone numbers are used for receiving and addressing concerns related to prescribed burns.

The LLNL fire dispatcher also notifies the following agencies/personnel on the morning of the burn. (Notification is made using a telephone or the mutual-aid radio frequencies):

- Site 300 Manager
- National Nuclear Security Administration/Oakland Operations Office
- SJVUAPCD
- California Department of Forestry, Emergency Communications Center, and Sunol Fire Station
- Alameda County Fire Department Station 8
- Stanford Research Institute (SRI) (test facility)
- San Joaquin County Fire Dispatch (includes Tracy Fire Department)
- Site 300 /LLNL Central Alarm Station dispatcher
- Twin Valley fire departments, which include Livermore-Pleasanton
- Alameda County fire department
- Camp Parks fire department
- San Ramon Valley Fire Protection District

▪ **Prescribed Burning Objectives and Strategy:**

The primary objective of the Site 300 prescribed burn is to create and maintain defensible prescribed natural fire boundaries which will prevent wildfires and the accompanying potential risks to human health, LLNL mission and operational capabilities, government and private property, and the environment. The LLNL Site 300 prescribe burn activities are conducted in accordance with the *LLNL Site 300 Prescribed Fire Plan (appendix)*. The following lists the three principle objectives of the *LLNL Site 300 Prescribed Fire Plan*, and the strategic elements by which the objectives will be met.

Objective #1: Use prescribed fire to meet management objectives:

- Preserve and extend the capability to safely test explosives while protecting the environment.
- Minimize the occurrence of unnaturally intense fires through the reduction of hazard fuels by management-ignited prescribed fires.
- Minimize the occurrence of fires that could leave the Site 300 boundaries and impact neighbors.
- Provide a fire-safe barrier to prevent wildfires from entering Site 300.

- Avoid those prescribed fires that would reduce the air quality for neighbors for an extended period of time (several hours).
- Provide opportunities for public understanding of fire ecology principles, and smoke management and prescribed fire program objectives.
- Monitor and evaluate the effectiveness of the prescribed fire management program.

Objective #2: Protect life, property, and Site 300 resources from the effects of unwanted fire:

- Conduct all fire management activities commensurate with applicable laws, policies, and regulations.
- Cooperate extensively with adjacent landowners to facilitate safe and prompt suppression of wildfires.
- Suppress all wildfires with minimum environmental and cultural resource impacts.
- Use prescribed fire and mechanically treat the Site's developed areas to reduce the threat of unwanted fire.
- Prevent unplanned human-caused ignitions through a cooperative fire prevention program.
- Provide for the safety of employees, visitors, and neighbors during all phases of the wildland fire management process.

Objective #3: Prevent adverse impacts from fire suppression:

- Use minimum-impact prescribed burns and fire suppression techniques and rehabilitate disturbed areas to protect natural or cultural resources from adverse impacts attributable to fire suppression activities.
- Engender understanding among fire fighters about the impacts of fire suppression on sensitive resources.

▪ **Prescribed Burning Process:**

The controlled burn is completed annually, before the beginning of the fire season, to minimize the potential for an escaped fire. Controlled burns are carefully planned and executed, taking into consideration the following: 1) the specific goals of each burn, 2) the meteorological conditions, 3) the consequences of loss of control and 4) the availability and adequacy of fire fighting resources in order to respond to potential escape-of-burn conditions.

The LLNL Fire Department conducts controlled burns at Site 300 as described in the LLNL Site 300 Explosive Test Facility Prescribed Fire Plan. These burns

occur only during daylight hours and under permit authorization of the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). About 1500 acres, divided into plots ranging from six (6) to two hundred and forty (240) acres, are burned each year. Existing service roads and fire trails, along with temporary control lines, wet-line firing methods and other natural barriers isolate the plot boundaries. Firefighters use the wind and climate conditions in conjunction with the natural and man-made barriers to direct the fires to burn plots in a safe and controlled manner.

Prior to the burn each year, the LLNL Fire Department applies for and obtains a Permit for Agricultural Burning from the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). They also submit a smoke management plan, as required by the SJVUAPCD. The day before a planned burn, the LLNL Fire Department contacts the SJVUAPCD to determine if the proposed burn date falls on a District-declared "burn day". If it does, the Fire Department monitors the wind conditions the night before and, if conditions are right, calls the SJVUAPCD at 7:00 a.m. to request to burn. The Fire Department then gives the SJVUAPCD its burn permit number and states the acreage that it wants to burn to insure that it fits within the Air District's allocation for that day. Coordination with the SJVUAPCD is critical. Recent rule changes by the SJVUAPCD may require that additional information be provided with the permit application to address the rule changes.

During the burn, the primary responsibility for fire suppression lies with the LLNL Emergency Management Division's Fire Department. Response is provided from both the LLNL Mainsite and Site 300 fire stations. The Fire Department is supported by a strong secondary response capability within the Alameda County Fire Departments and the California Department of Forestry. Mutual aid agreements between the LLNL Fire Department and the Alameda County Fire Departments and the California Department of Forestry have been in place since 1960. Parties to mutual aid agreements send their respective fire department units on a mutual aid basis into each other's jurisdiction in accordance with the specific mutual aid plan (e.g., Twin Valley Mutual Aid Plan). The Fire Chiefs involved in the agreements meet routinely to assure the continued effectiveness. A threat-zone agreement is also in place with the California Department of Forestry. This agreement provides aircraft, helicopters, and air command aircraft in addition to the basic response of eight engines, two bulldozers, and a Battalion Chief.

- **LLNL Site 300 Prescribed Fire Plan, January 2001:**

The LLNL Fire Department currently has a central role in the coordination and implementation of mutual aid agreements in Alameda County and is the Alameda County Representative for coordinating mutual aid with the California Office of Emergency Services (OES). These functions have given the LLNL Fire Department the opportunity to write and revise mutual aid agreements and review the operational documents of other fire agencies. Participation in Mutual Aid Agreements fosters frequent peer review of procedures and planning documents between LLNL and other fire agencies.

The purpose of the LLNL Site 300 Prescribed Fire Plan is to prescribe actions necessary to implement fire management policies and to achieve Laboratory mission objectives. The Fire Management Strategies Section of the Site 300 Prescribed Fire Plan articulates the strategies and procedures for conducting a controlled burn at Site 300. The following topics are addressed in the Fire Management Strategies Section:

- **Burning Prescriptions and Meteorological Conditions:**  
Acceptable ranges for temperature, relative humidity, windspeed and wind direction are tabulated.
- **Fuel Type and Amount:**  
The fuel loading for the project is ungrazed annual grassland estimated to be between 1 and 4 tons per acre.
- **Ignition Operations:**  
A small test ignition at the burn site is conducted at the beginning of each burn day to observe ignition combustion rates and monitor smoke behavior. All conditions must be satisfied before the decision to continue burning is made.
- **Smoke Management:**  
Smoke management is conducted to prevent prescribed burns from having a significant impact upon the surrounding communities.

Smoke emission and behavior are continually monitored and any significant change in smoke emissions and/or column behavior are reported to an assigned Incident Commander who is responsible to minimize impact to sensitive areas. The project size, firing tactics, and burn duration are adjusted to meet these goals.

- **Personnel and Equipment Prescription:**  
All burns are conducted with personnel and equipment as set forth in the LLNL Fire Department Policies and Procedures Manual, Tactical Plan Number 1606.
- **Monitoring and Evaluation Procedures:**  
The day of the burn, the Captain at Fire Station 2 logs onto the LLNL internal web page and selects reports (by 15-minute readings) to obtain the following current weather at Site 300.
  - Windspeed
  - Wind Gust
  - Wind Direction
  - Air Temperature
  - Dew Point
  - Relative Humidity

Based on experience over the past 40 years, the LLNL Fire Department is able to anticipate wind behavior (speed and direction) with a high degree



of confidence. This expert-based approach enables them to do the prescribed burning with a high level of control and safety. If the weather data from the internal web-page shows that wind speed constantly declined throughout the night and the morning-wind speed is less than 20 miles per hour, the burn is executed. However, if the winds are approximately 20 mph or greater, and not appreciably changing, then the burn is called off until the next day.

The day of the burn, the LLNL Fire Department Captain at Fire Station 2, enters into the incident report for the controlled burn, the following:

- Staffing and positions
  - Duration of burn
  - Plots burned
  - Weather as of 0700
  - Total acreage burned for the day
- **Public and Personal Safety:**  
A safety briefing is included at the pre-burn briefing. All personnel are advised of Lookouts, Communications, Escape Routes, and Safety Zones (LCES). Any potential safety hazards (power lines, etc.) are pointed out.

All burn personnel wear full standard wildland fire fighting and safety equipment at all times. All standard wildland fire fighter safety rules are strictly enforced.

A Safety Officer is appointed to oversee the entire operation. Effective communications are maintained throughout the conduct of the burn.

- **Contingency Plans for Out-of-Control Prescribed Burns:**

- **Escaped Fire Contingency Plan**  
All ignition operations stop if “spotting” or “slop-overs” occur. The Incident Commander supervises the initial containment effort.

The burn will be declared a wildfire if outside agency resources, not assigned to the burn, are requested and/or the resources on-scene are unable to contain the escape.

Should the burn become a wildfire, the Incident Commander will make a declaration of escape. The Incident Commander will immediately notify LLNL Fire Department dispatch and request wildland alarms as specified in the Twin Valley Mutual Aid Plan.

All Division supervisors will provide/ensure the safety for all personnel assigned to them prior to the escape. All personnel will be assigned holding or suppression duties.

Primary and secondary holding lines will be identified on each project map. Water sources (hydrants, drafting areas, etc.) will also be identified on the project map.

#### **EIS/EIR:**

- **Environmental Considerations, Efficacy of Controlled Burning, and Discussion of Alternatives:**

DOE's principle vehicle for compliance with NEPA at LLNL and Site 300 is the 1992 EIS/EIR, the 1997 Environmental Impact Report Addendum, and the 1999 Supplement Analysis to the 1992 EIS/EIR. These NEPA compliance (EIS) and California Environmental Quality Act (CEQA) compliance (EIR) documents were prepared to analyze the impacts of the proposed action of continued operation of LLNL and Site 300.

Prescribed burning is discussed throughout the EIS/EIR sections appropriate to the context, including safety, wildfire prevention, Site 300 testing requirements, natural resource impact, and potential impact to neighbors and planned adjacent communities. LLNL reviews plans for each year's controlled burns to insure that all operational, fire safety, regulatory and community notification issues are addressed and that adequate DOE NEPA coverage is available.

LLNL requires that all Laboratory operations be conducted in a manner that preserves the quality of the human environment and complies with the letter and spirit of all applicable governmental regulations and DOE Orders. A brief overview of the environmental considerations relating to existing land use follows:

- **Biota and Endangered Species:**

As outlined in the 1992 EIS/EIR, and its March 1999 Supplemental Analysis, Site 300 hosts a diverse ecology of upland flora and fauna species. From its southern boundary within the Corral Hollow Creek floodplain, the property rises dramatically in a series of southeast-northwest trending ridges to nearly the northern perimeter. Several ephemeral streams flow through Site 300 during the wet winter months and discharge into Corral Hollow Creek at the southern boundary of the site. Most flow is direct runoff with a very small contribution from both intermittent and perennial springs.

Site 300 has diverse wildlife and habitats. Less than 5% of Site 300's 7000-acre property area is developed, and areas with buildings are generally excluded from wildland settings and are surrounded by high-security fences; few of these complexes offer much habitat for native flora and fauna (Figure 3).

The primary vegetation types found at Site 300 are introduced grassland, native grassland, coastal sage scrub, and oak woodlands. The introduced grassland community covers about 5,647 acres (2,288 hectares) The native perennial grassland community is dominated by cismontane grass and covers about 723 acres (293 hectares). Stands of native grasslands are

confined mainly to the northern half of the facility. The third major vegetation community, coastal sage scrub, occurs in the southwestern part of the site and covers approximately 108 acres (44 hectares). It contains a mixture of four chaparral shrubs: California sagebrush, California buckwheat, black sage, and matchweed. Finally, the small oak woodland community is restricted to the north-facing slopes in the southern canyons and covers approximately 150 acres (61 hectares). This community includes a sparse cover of blue oak with an understory predominantly of three grasses: slender wild oat, soft cress, and ripgut brome. Also included is one native grass, *Elymus triticoides*, that is important in this community. Other, less common vegetation types are wetlands associated with seeps and springs, a few seasonal pools, northern riparian woodland habitat, and four localized, upland plant communities (which include the valley elderberry bush and the coastal sage scrub habitats).

Four rare floral species occur at Site 300 (Figure 3). The federally-listed endangered large-flowered fiddleneck (*Amsinckia grandiflora*), the diamond-petaled poppy (*Eschscholzia rhombipetala*), the big tar plant (*Blepharizonia plumosa*), and the gypsum-loving larkspur (*Delphinium gypsophilum*) have been found to occur at Site 300.

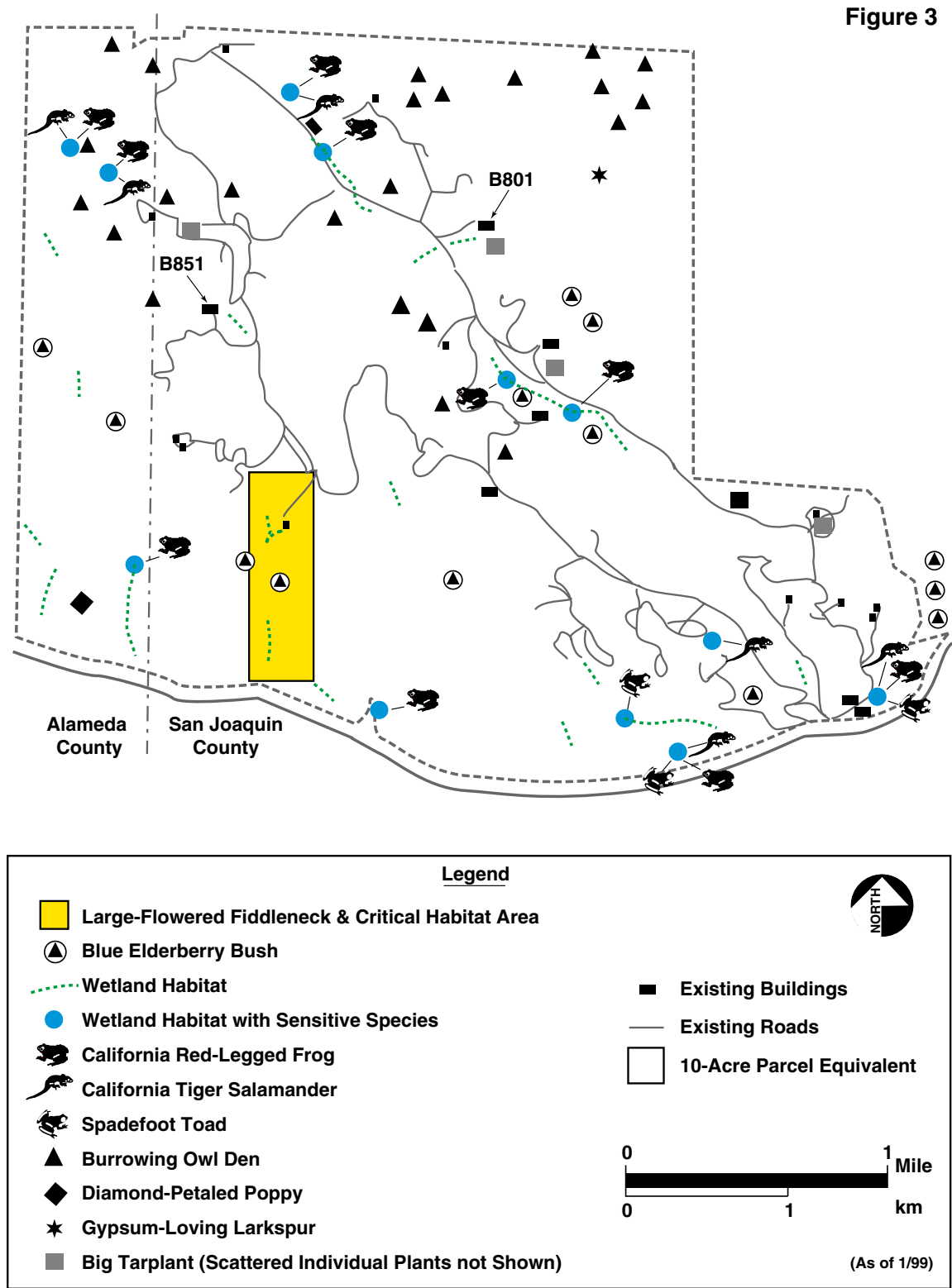
Fauna observed at Site 300 include a minimum of 20 species of reptiles and amphibians, 70 species of birds, and 25 species of mammals. Mammal species include mice, hares and rabbits, squirrels, skunks, foxes, and black-tailed deer. Burrowing owls, red-tailed hawks, and bald eagles have been observed at Site 300. One transient Swainson's hawk (*Buteo swainsoni*, threatened) and two transient peregrine falcons (*Falco mexicanus*, endangered) have been observed.

- **Environmental Impacts:**

Fire has been one of the primary forces that created and maintains the biodiversity and specialized wildlife habitats throughout Central California. Site 300 ecological communities have evolved in association with fires, and, in fact, require fire for proper growth and health. Heavy fuel accumulation in these predominately grassland ecosystems is unusual and rare. Occurrence of the important native grass-dominated vegetation appears to be associated with annual controlled burning. There is a concern that the reduction in acreage burned at Site 300 in recent years may result in a contraction of native grassland communities at the Site.

Research at Site 300 on *Amsinckia grandiflora* has shown the native bunch grass habitat to provide a more favorable matrix for *Amsinckia grandiflora* (Carlsen et al. 2000) than introduced grassland. In addition, ongoing work suggests that a complex interaction with fire is required to maintain the metapopulation structure of this species (Carlsen et al. 2001). The *Amsinckia grandiflora* Reserve, designated per a memorandum of agreement between DOE and the U.S. Fish and Wildlife Service (USFWS) is not included in the annual routine prescribed burn at Site 300. However, the 1997 *Amsinckia grandiflora* Recovery Plan (USFWS 1997)

Figure 3



calls for research into the use of controlled burns as a tool for *Amsinckia grandiflora* recovery. These are small research burns conducted as part of the coordinated effort between DOE, the University of California, and the U.S. Fish and Wildlife Service to enhance *Amsinckia grandiflora* recovery. The next research burn of this type is planned for Spring of 2001.

Most wildlife species at Site 300 benefit from the presence of fire. The resulting environmental conditions bolster habitat diversity, the nutritive quality and availability of food supplies, and the yield of forage. Endemic wildlife exhibit specialized and adaptive lifestyles to survive the element of fire on the property. It is a misconception that many animals are killed by fire. Wildlife usually escapes by fleeing the area, hiding underground, or moving to an adjacent unburned island until the fire has passed. Post-burn surveys by the LLNL Wildlife Biologist are routinely conducted immediately following the prescribed burn and no whipsnake, red-legged frog, or other herpetofauna mortality has been observed to date. Annual prescribed burns onsite move quickly and have relatively low heat value due to the frequency of burning and low fuel-volume overall. Site 300 has one of the last remaining native bunchgrass prairies as a direct result of the annual burn activity. This unique habitat occurs almost solely within the prescribed burn areas. The beneficial nature of these burns is also acknowledged in the 1992 EIS/EIR for operating LLNL.

Prescribed burning conducted at Site 300 is considered a long-term asset to air quality as it reduces the potential for destructive wildfires. In addition, the fires remove potential airborne residues that accumulate, such as pollen and other respirable matter.

Fire management practices conducted at Site 300 minimize the impact of smoke on air quality through the following Best Available Control Measures:

- Fires are ignited by SJVUAPCD-approved methods.
- Fires are only conducted in daylight hours. Smoke is visually monitored.
- Fires are not allowed to smolder after the area has been burned.
- The vegetation is determined to be dry enough to sustain a complete burn.
- The preferred timing for burning is in late-May and early-June, based upon a judgment that the vegetation is dry enough to sustain a complete burn but preferably before declaration of the fire season. Declaration of fire season imposes added restrictions to site activities and may cause additional fire danger.
- Conduct existing environmental surveillance during burn.

#### • Alternatives to Prescribed Burns

Alternatives to prescribed burning have been researched, to include livestock grazing, disking, and sterilization (herbicides), planting fire resistive non-native vegetation, and mowing. Livestock grazing was found to be non-beneficial due to its threat to native grasses, wetlands, and endangered species and is also limited in value due to the restriction

of areas available to grazing. Disking was found to have limited benefit but has been used on an infrequent basis on a small portion of the site perimeter in lieu of controlled burning to avoid the spread of fire to adjacent private lands. Mowing is not suited for most areas because of the terrain. Herbicides are used around facilities where controlled burning could pose a threat to them. The planting of fire-resistant non-native species would pose a further threat to native grasses.

- **Livestock Grazing:**

In June 1991, during the preparation of the 1992 LLNL EIS/EIR, cattle and sheep grazing was examined as an alternative to the annual controlled burn activity. Initially it appeared that grazing would be an excellent alternative that would reduce air pollution and foster good relationships with neighboring cattle and sheep ranchers. However, upon closely examining the implementing requirements and impacts associated with grazing, other issues and problems were identified, as outlined below.

- ✓ Livestock grazing poses a threat to native grasses, wetlands, and endangered species, etc. With the recent designation of critical habitat for the Alameda whipsnake the Red legged frog, almost the entire Site would be unavailable.
- ✓ Grazing of animals would also need to be restricted to outside of the 4,000 ft.-muster areas for all past and present open firing facilities This would preclude grazing in nearly all of the areas subject to prescribed burning.

The 1992 EIS/EIR (Appendix H) states that the exclusion of grazing and other agricultural activities has resulted in a greater diversity of plant community types at LLNL Site 300 than nearby grazed lands because of more stable plant cover, including soil-building native plant species.

- **Disking and Mowing:**

The exclusion of agricultural practices (such as disking and mowing) has resulted in a more diverse plant community which, in turn, provides vital habitat for endemic (including endangered) animal species. For this reason, disking for prevention/control of wildfires has been limited to only two small areas. The north-central and north-northeast perimeter of Site 300 (both areas are outside the designated Critical Habitat Areas [CHAs]) have been infrequently disked (in May) to prevent the spread of wildfires in the most vulnerable area onsite (see Figure 2). If disking occurs, it is roughly 30 m wide and immediately adjacent to the fenceline. Disking at the fenceline is used in lieu of controlled burning to avoid the spread of fire to those specific adjacent private lands. The area is an upland habitat composed of annual grasses; no riparian habitat, wetlands or sagescrub patches occur in or near the disked area.

Preactivity surveys for the presence of sensitive natural resources are performed prior to disking, and Site 300 maintenance staff annually receive training on special-status species identification and distribution. The Site 300 maintenance staff has taken action on numerous occasions to protect sensitive wildlife and habitats (e.g., American badger dens) from the potential effects of disking. No known mortality of special-status wildlife has occurred as a result of the disking activity during the past eight years. The perimeter disking project proceeds only after approval is received from the LLNL Wildlife Biologist after a field survey.

Mowing is not well suited to most areas at Site 300 because the terrain is too hilly and rocky for mowers. Numerous rocks and boulders make mowing hazardous in flatter terrain as sparking (when a mower blade strikes a rock) can ignite the dry grass.

- **Use of Herbicide in Explosives Firing, Facility Structures, and Other Developed Areas:**

Site 300's core mission as an outdoor explosives test site inherently requires that areas around the firing tables (Buildings 850, 851, 812, and 845) be clear of vegetation that could potentially ignite and cause a wildfire. Herbicides (e.g., Krovar [pre-emergent] plus Round-up [emergent vegetation] applied by onsite licensed and permitted individuals) are sprayed around facilities, fencelines, and firing tables as a routine activity in early Winter (November/December) because controlled burning immediately adjacent to these facilities could pose a threat to the facilities (see Figure 2). This procedure has occurred for nearly as long as the site has been operating (40 + years). Herbicides are only used in the previously mentioned areas, and not in the large tracts of land where controlled burning is employed, because they limit plant ecosystem diversity unlike controlled burning which fosters the growth of native plants.

Road shoulders, distribution lines, water tank pads, the pistol and rifle ranges, and other developed areas around infrastructure, also require applications of herbicide to control unwanted annual vegetation. At no time are herbicides sprayed on habitat structure suitable for the Alameda whipsnake or Red-legged frog. Prior to late-Fall application, ground areas subject to spraying are assessed by the LLNL Wildlife Biologist. Also, herbicide projects proceed only after approval is received from the Wildlife Biologist after a field survey.

- **Planting of Fire-resistant Non-native Species:**

The planting of fire-resistant non-native species would pose a further threat to native grasses. The native grasses provide a more favorable habitat for other native flora and fauna.

## **Other Key Documents and Practices**

### **▪ EIRs for the Proposed Tracy Hills Project**

Site 300 Management and staff and LLNL CEQA staff were in continuous dialogue with both the City of Tracy Planning staff and the developer of the proposed Tracy Hills Project from the late-1980s through 1997. These discussions focused on the potential impacts to the proposed Tracy Hills subdivision from LLNL Site 300 operations. Key issues raised in numerous letters, visits, and public meetings of both the City of Tracy Planning Commission and the City Council included explosives safety, transportation/traffic, noise, and the conduct of annual control burns. Additionally, both DOE/OAK and LLNL staffs appeared before public meetings of the Commission and the Council during the 1993 to 1997 period while the draft Tracy Urban Management Plan EIR and the draft Tracy Hills Specific Plan EIR were being reviewed by the public. Written comments by both LLNL and DOE/OAK on these drafts also were provided to the City. For example, an LLNL letter of March 20, 1997, commenting for the second time on the draft EIR for the Tracy Hills Specific Plan, reminded the City to insure that it considered land use compatibility issues that derived from proposing a residential subdivision adjacent to Site 300. The letter noted the potential for anxiety and damage from annual controlled burns.

The City's response to the letter was that impacts deriving from controlled burns were adequately covered in the Land Use and Air Quality sections of the final Tracy Hills Specific Plan EIR. In this final 1997 EIR, the potential impacts from controlled burns were not cited as significant potential impacts.

In addition to the various letters sent during public comment periods for the cited EIRs, LLNL staff attended and commented on potential impacts from Site 300 operations in more than twenty public meetings held by the City.

Thus, the City has been apprised numerous times of Site 300's controlled burn program and has not considered it to be a significant impact with respect to the proposed Tracy Hills Project.

### **▪ Pre-burn Sensitive Species Survey:**

Each year, a prescribed burn planning meeting is held to evaluate what areas should be included in that year's schedule, address the environmental and safety requirements associated with any new areas, and to schedule pre-activity surveys. These pre-activity surveys are conducted by the LLNL Wildlife Biologist to review the pre-burn status and to check for sensitive species. The biologist is also in the field during the annual burn.

### **▪ Technical Assistance Request (TAR) for Annual Maintenance and Operational Activities at Site 300 within the Designated and Proposed Critical Habitat Units for the Alameda Whipsnake and California Red-legged Frog, Respectively:**

In view of the recent designation of Critical Habitat Areas (CHAs) for Alameda whipsnake and Red-legged frog, which include portions of Site 300, LLNL has coordinated with the USFWS staff on any additional consultation



requirements that may accrue. Based on this dialogue, the USFWS indicated that only an informal consultation Technical Assistance Request (TAR) was needed as the review for continued conduct of routine recurring CHA maintenance projects at Site 300; this list of activities includes the conduct of annual controlled burns. This TAR consultation is currently being reviewed by USFWS and their decision/recommendation regarding the Site 300 projects and processes is expected in April 2001.

▪ **Description of Analysis Results for Out-of-Control Fire:**

A prescribed fire leaving Site 300 and entering a neighbor's grazing land is a very unlikely event. An out-of-control fire would be extinguished by applying the procedure and resources described in the LLNL Site 300 Explosive Test Facility Prescribed Burn Plan.

Site 300 is predominantly grassland with a relatively small fuel load. Consequently, wildfires and fires ignited for prescribed burns are low in intensity and of short duration (usually measured in minutes). It follows that the risk to property, wildlife and people is relatively low when compared to wildfires with significantly higher fuel loads. By contrast, the CY 2000 Cerro Grande Fire at Los Alamos National Laboratory burned through stands of heavily wooded conifer and pinion-juniper forests. This fire was very intense and released large quantities of smoke which made fire fighting very risky. Lands that border Site 300 on the west, east, and north are used for cattle grazing. These grasses are very similar to those found at Site 300 with the exception of the grass height. Grasses that have been grazed are usually less than three inches tall.

There have been no incidents of a loss-of-control fire associated with a controlled burn at Site 300. However, in 1984, a wildfire was accidentally started at Site 300 during a waste explosives burning operation, which was conducted prior to the annual controlled burn. Fanned by 60 mph gusts of wind, this fire quickly raced across Site 300 and the adjoining ranchland, reaching Interstate (I-5) Freeway. The fire jumped the highway but stopped when it reached the nearby aqueduct and irrigated farmland where it could advance no further. No buildings were damaged (because the ranchland east of Site 300 is practically devoid of improvements) and there were no injuries to humans or losses of livestock. This wildfire demonstrated that a wildfire with a Site 300 origin could not advance past the greenbelt and into inhabited areas. The explosives burning facilities and procedures have since been replaced and improved to prevent the same kind of accident from happening again.

During the CY 2000 fire season two small wildfires started and were quickly extinguished by the LLNL Fire Department. The first fire started when a contractor doing torch cutting at Site 300 accidentally ignited dry grass. The LLNL Fire department was notified and promptly put out the fire less than a half hour after it started. The second fire was started by a LLNL vehicle which had been parked off-road during a field sampling activity. Heat from the

catalytic converter ignited dry grass. The vehicle driver notified the LLNL Fire Department which promptly responded and extinguished the fire after only a third of an acre of grassland burned, well before it had a chance to advance close to a property boundary. Procedures were reviewed and changed to prevent the same kind of accident from happening again.

- **Coordination with local fire districts and government agencies:**

- **Local fire Districts (MOUs)**

- The primary fire suppression responsibility for the area lies with the LLNL Emergency Management Division's Fire Department. Response is provided from both the LLNL fire stations. The fire department is supported by a strong secondary response by all the Alameda County Fire Departments and the California Department of Forestry. Mutual-aid agreements between the LLNL Fire Department and the Alameda County Fire Departments and the California Department of Forestry have been in place since 1960. A threat zone agreement is also in place with California Department of Forestry. This agreement provides aircraft, helicopters, and air command aircraft in addition to their basic response of eight engines, two bulldozers, and a Battalion Chief.

- **SJVUAPCD Permit**

- As a result of its area air quality attainment status and recent changes to its rules, the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) has put into place a new rule to manage prescribed burns. This new rule imposes more stringent review and approval requirements before allowing burns to take place. The requirements of this new rule reduces, to the maximum extent possible, the contribution of pollutants from burn activities in the SJVUAPCD. LLNL will continue to meet SJVUAPCD requirements and fully expects to continue to be allowed permission to conduct prescribed burns at Site 300. Also, Site 300 burns are considered "low-intensity", thus contributing a lesser proportion of very small smoke particulates that pose the highest health effect threat. The burns are conducted only during daylight hours when smoke can be visually monitored.

- **Actions Performed in Light of the Cerro Grande Fire**

- **Questionnaire for DOE Sites Wildland and Prescribed Fire, September 2000:**

- As a result of the Cerro Grande fire in New Mexico, the DOE conducted a review of fire vulnerabilities in the wilderness areas of its sites. The purpose of this questionnaire was to establish data consistency across the complex. As part of this review, LLNL Site 300 management completed the Wildland and Prescribed Fire Questionnaire for DOE Sites. A DOE Working Group was chartered to examine existing policies, procedures, and practices related to wildland and prescribed fire management and will provide input to formulate a DOE Policy in this area. In addition, Headquarters representatives are participating in the National Wildfire Coordinating Group review of the Federal Wildland Fire Management Policy and Program.

- **Initial Joint Review of Wildland Fire Safety at DOE Sites, December 2000:**

The *Initial Joint Review of Wildland Fire Safety at DOE Sites, December, 2000* documents the results and recommendations from initial joint review conducted between October 15 and December 15, 2000, by the U.S. DOE Offices of Independent Oversight and Performance Assurance (OA), Security and Emergency Operations (SO), and Environment, Safety and Health (EH). The purpose of the initial joint review was to assess the abilities of DOE sites to prevent and respond to wildland fires and provide recommendations for pertinent site-specific and DOE-wide improvements. In addition, the review was to provide recommendations regarding the scope and conduct of the comprehensive follow-on fire safety review. The initial joint review included an examination of DOE and national-level policies applicable to wildland fire management, onsite reviews of lessons learned at the three DOE sites that experienced major wildland fires in calendar year (CY) 2000, and visits to four other major DOE sites to collect information on their wildland fire management programs. LLNL was visited as one of the four other major DOE sites. LLNL has prepared a corrective action plan to implement the improvements cited in the *Initial Joint Review of Wildland Fire Safety at DOE Sites, December, 2000*, in response to a directive to LLNL from the Assistant Manager for National Security, DOE/OAK, dated February 26, 2001.

This report can be viewed online at:  
<http://tis.eh.doe.gov/iopa/reports/emevals/emevals.html>

#### **Appendix:**

*LLNL Site 300 Explosive Test Facility Prescribed Fire Plan (January 2001)*

#### **References:**

- DOE EIS-0157: *Final Environmental Impact Statement and Environmental Impact Report (EIS/EIR) for Continued Operation of the Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore* (August 1992)
- *Environmental Impact Report Addendum for Continued Operation of the Lawrence Livermore National Laboratory* (September, 1997)
- *Supplement Analysis for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore* (March 1999)
  - EIR, Tracy Hills Specific Plan, City of Tracy, 1997
  - EIR, City of Tracy General Plan/Urban Management Plan, 1993
- Initial Joint Review of Wildland Fire Safety at DOE Sites, December 2000 (Available on Web at <http://tis.eh.doe.gov/iopa/reports/emevals/emevals.html>)
- Questionnaire for DOE Sites Wildland and Prescribed Fire, September 30, 2000